CLAIMS

1. A fuel cell system comprising:

a fuel cell which generates electric energy by electrochemical reaction;

a first tank which holds fluid discharged from the fuel cell;

a second tank arranged to receive fluid that is stored in the first tank;

a first drive device arranged to move the fluid in the first tank to the second tank; and

a controller arranged to control operation of the first drive device at a time of non-power-generation.

2. The fuel cell system according to Claim 1, wherein the time of non-power-generation is a time after power generation is finished, and the second tank includes an aqueous solution tank which holds fuel aqueous solution to be supplied to the fuel cell.

3. The fuel cell system according to Claim 2, further comprising a first channel which connects the first tank with the aqueous solution tank.

4. The fuel cell system according to Claim 2, further comprising a second drive device arranged to move fluid in the fuel cell to the first tank,

wherein the controller is arranged to control operation of the second drive device after power generation is finished.

5. The fuel cell system according to Claim 4, further comprising:

a first channel disposed so as to connect the first tank with the aqueous solution tank; and

a second channel disposed so as to connect the fuel cell with the first tank.

6. The fuel cell system according to Claim 5, wherein the controller is arranged to control operation of the first drive device and the second drive device based on temperature information of the fuel cell system.

7. The fuel cell system according to Claim 5, wherein the controller operates the first drive device and the second drive device again in a predetermined amount of time after operating the first drive device and the second drive device.

8. The fuel cell system according to Claim 5, wherein the aqueous solution tank has a volume V which satisfies:

$$V \geqq v1 + (v2 + v3 + v4 + v5) \times \left(1 + \frac{p2}{p1 - p2}\right)$$

where V represents the volume of the aqueous solution tank; v1 represents the volume of methanol aqueous solution in

the aqueous solution tank during power generation; v2 represents the volume of fluid storable by the first tank; v3 represents the volume of fluid which can remain in the first channel; v4 represents the volume of fluid which can remain in the second channel; v5 represents the volume of fluid which can remain in the fuel cell; p1 represents a concentration of fuel; and p2 represents a maximum concentration of fuel aqueous solution.

9. The fuel cell system according to Claim 1, further comprising an air pump arranged to supply the fuel cell with air necessary for generation of electric energy, and a sensor arranged to detect an amount of fluid in the first tank; wherein

the first tank includes an exhaust port;

the first drive device includes a water pump;

the controller is arranged to control operation of the water pump based on the amount of fluid in the first tank detected by the sensor, at the time of non-power-generation.

10. The fuel cell system according to Claim 9, wherein the time of non-power-generation is before power generation is started, and the controller is arranged to control operation of the water pump before operating the air pump.

11. The fuel cell system according to Claim 9, wherein the time of non-power-generation is after power generation is finished.

12. The fuel cell system according to Claim 9, wherein the controller is arranged to control the operation of the water pump based on the volume of fluid in the first tank detected by the sensor, at a predetermined time interval after power generation is finished.

13. The fuel cell system according to Claim 9, wherein the second tank includes an aqueous solution tank which holds fuel aqueous solution to be supplied to the fuel cell.

14. The fuel cell system according to Claim 13, wherein the fuel cell is disposed at a lower position than the aqueous solution tank.

15. The fuel cell system according to Claim 9, wherein the system is a direct methanol fuel cell system.

16. Transport equipment comprising the fuel cell system according to Claim 1.

17. A control method for a fuel cell system including a fuel cell which generates electric energy by electro-chemical reaction, a first tank which holds fluid discharged from the fuel cell and a second tank to which fluid in the first tank is introduced, wherein the method comprises the step of:

moving fluid in the first tank to the second tank at a time of non-power-generation.

18. The control method for a fuel cell system according to Claim 17, wherein the second tank includes an aqueous solution tank which holds fuel aqueous solution to be supplied to the fuel cell, and the step of moving fluid in the first tank to the second tank is performed such that the fluid in the first tank is moved to the aqueous solution tank after power generation is finished.

19. The control method for a fuel cell system according to Claim 18, wherein the fuel cell system further includes a first channel which connects the first tank with the aqueous solution tank, fluid in the first tank being moved to the aqueous solution tank via the first channel after power generation is finished.

20. The control method for a fuel cell system according to Claim 18, wherein fluid in the fuel cell is moved to the aqueous solution tank via the first tank after power generation is finished.

21. The control method for a fuel cell system according to Claim 19, wherein the fuel cell system further includes a second channel which connects the fuel cell with the first tank, and wherein fluid in the fuel cell and fluid in the second channel are moved to the aqueous solution tank via the first tank and the first channel after power generation is finished.

22. The control method for a fuel cell system according to Claim 21, wherein the fluid is moved to the aqueous solution tank based on temperature information of the fuel cell system after power generation is finished.

23. The control method for a fuel cell system according to Claim 21, wherein after power generation is finished and the fluid is moved to the aqueous solution tank, fluid is moved to the aqueous solution tank in a predetermined amount of time.

24. The control method for a fuel cell system according to Claim 17, wherein the fuel cell system further includes an air pump for supplying the fuel cell with air necessary for the generation of electric energy, the first tank having an exhaust port, and fluid in the first tank is moved to the second tank if an amount of fluid in the first tank exceeds a predetermined amount, at the time of non-power-generation.

25. The control method for a fuel cell system according to Claim 24, wherein fluid in the first tank is moved to the second tank prior to driving the air pump if the amount of fluid in the first tank exceeds a predetermined amount, before power generation is started.

26. The control method for a fuel cell system according to Claim 24 or 25, wherein fluid in the first tank is moved to the second tank if the amount of fluid in the first tank exceeds a predetermined amount, after power generation is finished.

27. The control method for a fuel cell system according to Claim 24, wherein the process of moving fluid in the first tank to the second tank if the amount of fluid in the first tank exceeds a predetermined amount is performed at a predetermined time interval, after power generation is finished.